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Question Paper Code: 31064

B.E. / B.Tech. DEGREE EXAMINATION, OCTOBER 2014.

Third Semester

Instrumentation and Control Engineering

01UIC304 – MEASUREMENTS AND INSTRUMENTATION

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What is Calibration?
2. Define Static error.
3. What is meant by creeping in energy meter?
4. Which torque is absent in energy meter? Why?
5. Write the applications of D.C Potentiometer?
6. Compare C.T and P.T construction.
7. What is the sensitivity of Wheatstone bridge?
8. State the advantages of using the bridge circuits for the measurements.
9. State the advantages and limitations of the Maxwell Bridge.
10. Draw the Schering bridge circuit for the following specification.
Arm AB – Capacitor of $1\mu\text{F}$ in parallel with $1.2\text{K}\Omega$ resistance.
Arm AD – Resistance of $4.7\text{K}\Omega$.
Arm BC – Capacitor of $1\mu\text{F}$.
Arm CD – Unknown Capacitor C_x and R_x .

PART - B (5 x 16 = 80 Marks)

11. (a) Describe the constructional details and principle of operation of a d' Arsonval Galvanometer. Derive the expression for steady state deflection. (16)

Or

- (b) Explain the working of (i) Attraction type and (ii) Repulsion type of moving iron instruments with necessary diagrams. Describe the methods of producing controlling and damping torques in them. (16)

12. (a) Describe the constructional details and working of the electro-dynamometer type instrument. Derive the torque equation of electro-dynamometer type instrument. (16)

Or

- (b) Describe the construction and working principle of single phase induction type energy meter. (16)

13. (a) Explain how Drysdale – Tinsely a.c Potentiometer is standardised. (16)

Or

- (b) Discuss in detail about the working principle of Instrument Transformer. (16)

14. (a) Why Kelvin's Bridge is preferred? Derive the bridge balance equation for the Kelvin's Double Bridge. (16)

Or

- (b) Explain in detail about the construction and working of Megger. (16)

15. (a) How Schering Bridge is used for the measurement of unknown Capacitor? Derive its balance equation and also state its advantages. (16)

Or

- (b) Derive an expression for balance condition of Anderson's bridge. Draw the Phasor diagram for under balance condition and also write its advantages and disadvantages. (16)